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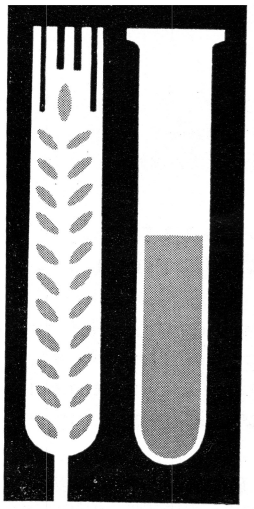

THE WORLD FOOD SITUATION

Economically advanced and under-developed countries show great contrasts in food production and consumption. Population growth and widespread desire for improved diets are adding to pressure on world food supplies.

by Leroy Blakeslee, Lon Cesal and Earl O. Heady

AMERICAN consumers often think of the food problem as "keeping the waistline in check." And United States farmers are plagued with low prices and income resulting from food supplies exceeding effective demand.

But many of the world's people face far different food problems — insufficient food and low quality diets. The implications of these coexisting problems suggest that agriculture may play an important international role in future years.

Today the production of one out of every four farm acres is shipped abroad. *But the technology and "know-how" behind this ability to produce may be an even more critical export to countries with serious food shortages.*

What, then, is the true world food situation? What are the recent trends, and what factors may determine future trends?

Precise answers cannot be given, because our information is often incomplete or not fully reliable. Yet we can give some answers.

Recent Trends . . .

The Food and Agriculture Organization of the United Nations (FAO) estimates, available for 1934-38, 1948-52 and 1957-59, provide a basis for assessing trends in food availability in recent years.

Throughout this period the people of North America, Oceania and Europe (including the USSR) enjoyed substantially better diets than the people in Africa, the near East, Latin America or the Far East (including mainland China). Calorie availability, a rough indicator of total diet nutrients, was markedly higher in the former regions than in the latter. In fact, the low consumption regions had per capita calorie supplies of about 2,000 per day compared with about 3,000 in the high consumption regions. Moreover, average supplies in the Far East, Near East, Latin America and Africa were less than the physiological requirement established by FAO nutrition experts, while supplies in Europe, North America and Oceania were well above minimum requirements.

Using per capita animal protein supplies as an indicator of diet quality, Europe, North America and Oceania had per capita supplies of about 35 grams per day while the rest of the world had about 10.

In any comparison the Far East has special significance because slightly over half of the world's people live there. Thus, its prewar animal protein supply of only 7 grams per person per day, when contrasted to the world average of 18 and North America's 50, indicates not only a low quality diet but also a large deficiency of total agricultural production.

Just following the war, 1948-52, per capita calorie and animal protein supplies for the entire world were estimated to be 94 and 100 percent of their respective prewar levels. But on a regional basis, the greatest drops occurred in those parts of the world which could least afford them. Most severely affected was the Far East where, from an already substandard position, calorie supplies had fallen to 90 percent and animal protein to 86 percent of prewar levels.

By 1957-59, however, even the low consumption regions had per capita calorie supplies approximately equal to prewar amounts. The Far East and Near East had even made some gains above prewar supplies in animal protein. By the late 50's, then, the world had almost erased the effects of World War II on food supplies but had done little to improve the lot of the poorly fed part of its population compared to two decades earlier.

In assessing trends in recent years, we will consider only the diet-deficient regions. No comprehensive estimates of food from all sources are available, but USDA estimates show food production per capita for selected countries. The available evidence is disturbing. During the last six years, only the non-communist Far East has moved per capita food production much above the 1958-59 level. Even there, the movement since 1961 has been downward.

In the other three low consumption regions, per capita production has fluctuated around the 1958-59 level. These fluctuations suggest that the upward trends of the late 40's to the mid-50's may have leveled off near the 1958-59 level. It is impossible to make strong statements on the basis of limited data, but it is quite clear that the nutritional problems of the world are far from being solved.

Composition of Diet by Regions . . .

Diet makeup, or content of different foods, varies widely from region to region, according to FAO's study of the 1957-59 world food situation. Of the four lower

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consumption regions, all but Latin America rely on cereals, starchy roots and sugar for over 70 percent of their calories. The Far East has the highest percentage, 81. The calorie percentages from these foods in North America and Oceania diets, 40 and 48 respectively, were well below those of any other region. Concentrations like those of the diet-deficient areas are cause for concern. Too much reliance on these foods increases the chance of vitamin, mineral or protein deficiencies.

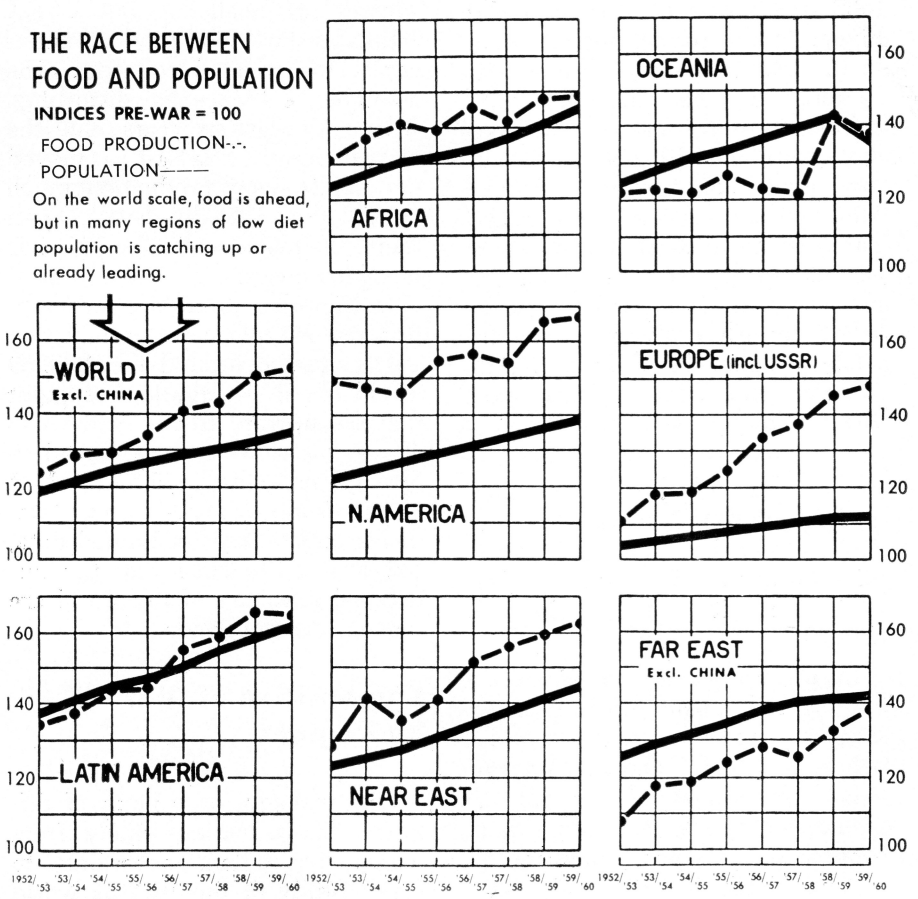
Proteins are supplied primarily by livestock products and pulses (legume seeds such as peas or beans). Since the consumer cost per unit of protein is lower for pulses, the low consumption regions, which generally are also the low income regions, use pulses at a rate two to three times that of the high consumption regions but only about one-fifth of the animal protein. Total protein consumption from all sources in the diet-deficient regions was two-thirds that of the high consumption regions.

In the Near East and Latin America, per capita consumption of fruit and vegetables was about the same as in the developed regions, but the Far East and Africa consumption was about half that of the other regions. Per capita consumption of fats and oils was two to three times greater in the developed regions than in the under-developed regions.

In general, under-nutrition and malnutrition are serious problems in some parts of the world. None of the four diet-deficient regions had average calorie supplies much above the minimum physiological requirement, and the Far East, with half the world's population, had only 90 percent of the requirement. Even in Africa, the Near East and Latin America where average calorie supplies were slightly above the minimum, significant parts of the population had fewer than average calories.

In developed regions, a 20 percent margin above requirements guarantees that only the most poorly fed were subject to under-nutrition.

The incidence of malnutrition, or imbalanced diets, is much harder to gauge, but FAO has estimated that 60 percent of the population of the less developed areas were malnourished in 1957-59.



From "Statistics of Hunger," FAO, 1962

Factors Affecting the Future Food Situation . . .

While no one can predict precisely the future pattern of world food consumption, we can consider some important underlying forces.

Population growth is one of the most important forces affecting food demand. There is a special urgency attached to the present world population picture beyond what has been normally present. Lester Brown, Economic Research Service, USDA, presents a brief but forceful summary of this urgency in his *Land, Man and Food:*

> "At the time of Christ, world population was estimated to have numbered about 250 million. This number slowly expanded, and by 1600, it had doubled, reaching 500 million. During this 16-century interval the rate of increase ranged **between 2.5 and 5 percent per century.** By 1900 **the annual rate** of increase was nearly 1 percent. As of 1960, it was about 2 percent and expected to be well above this figure for the rest of the century."

Current population growth rates vary considerably between world regions. Japan and many countries in Europe have growth rates of about 1 percent or less per year. At the other extreme, annual rates of increase in excess of 3 percent are now common in many Latin American countries.

Falling death rates are the major cause of this increased rate of growth. Rates will continue to fall as medical knowledge improves.

Birth rates are much less predictable. Generally speaking, low birth rates seem to be associated with the developed countries and higher birth rates with the less developed countries.

Income gain. Future gains in per capita income brought about by economic development may greatly affect food demand in the less developed areas. These areas will devote a major share of any income gains to more fully meeting their basic needs for food.

Advanced technology. Practices such as fertilization and use of herbicides, insecticides and improved crop varieties have caused great production increases in the United States and other developed areas. Wider adoption would certainly expand production. Furthermore, there are unused soil resources in most regions, although available estimates of potential expansion differ widely. For example, FAO statistics indicate that land planted to crops could be increased by about 50 percent. On the other hand, Charles Kellogg of USDA estimates that world crop area could be increased nearly 90 percent.

There are serious problems connected with advancing technology. The critical shortages of basic transportation, communication and education facilities are strong blocks to progress in many countries. Trained manpower is often in very short supply. For example, Kenya and India now have 0.87 and 2.40 engineers and scientists per 10,000 population, respectively, while Norway and the United States have 74.4 and 61.7.

Possible Future Food Needs . . .

The full dimensions of agriculture's future task can best be seen by examining future food needs under different possible assumptions about population growth and per capita consumption. For future population growth we will consider two alternative sets of projections prepared by the United Nations in 1958. With each population assumption we will consider two consumption possibilities: (1) maintaining per capita consumption at 1958 levels, and (2) raising consumption in each country to the long-term target levels established by FAO nutrition experts.

Let us compare 1975 and 2000 food needs under these alternative assumptions with the food supplies available in 1958.

Assuming slow population growth and no improvement in nutrition levels. Under these assumptions, world food supplies would need to expand about 24 percent by 1975 and 69 percent by 2000. In the Far East, needed expansion by 2000 would be about 78 percent. For Latin America (where low population growth rate is a questionable assumption) food supplies would need to grow 41 percent between 1958 and 1975 and 122 percent by 2000.

Projected food needs in Europe and North America are relatively modest. North America's requirements would grow 21 percent by 1975 and 43 percent by 2000, and Europe's would expand 16 and 32 percent.

Assuming rapid population growth and no improvement in nutrition levels. Here we find that estimated food requirements would increase 33 percent by 1975 and 139 percent by 2000.

Latin America with its high population growth rate of 2½ to 3 percent per year would increase its food needs by 52 percent by 1975 and 226 percent by 2000. In the 25 years between 1975 and 2000, its population and food needs would more than double.

Assuming slow population growth and improved nutrition levels. If the aspirations of many diet-deficient countries are to be met, even greater gains than already estimated must be made. With slow population growth and per capita consumption at FAO's target levels, the 1975 world supplies of calories, total protein and animal protein would need to increase by 35, 44 and 74 percent respectively. The corresponding gains needed by 2000 would be 83, 96 and 136 percent.

Generally, the diet-deficient countries would require the greatest percentage increases in animal protein, less in total protein, and least in calories to raise consumption to target levels.

In less developed regions, adding the effects of improved nutrition and population raises food needs strikingly. In the Far East, the region with most serious diet deficiencies, calorie supplies would need to rise 46 percent by 1975. In contrast, the needed increase when no diet improvement was assumed was 25 percent.

To reach the improved diet levels for total protein and animal protein in underdeveloped regions by 1975, supplies would need to rise 65 and 234 percent above 1958 levels. Needed calorie, protein and animal protein increases by 2000 would be 107, 135 and 374 percent respectively.

Assuming rapid population growth and improved nutrition levels. This is the most demanding assumption. Here the 1975 requirements for calories, protein and animal protein over the world are estimated to be 44, 55 and 86 percent above 1958 levels. For 2000, the corresponding figures are 158, 177 and 234 percent.

In the under-developed areas, needs are again substantially greater. Calorie supplies would need to be about triple their 1958 levels by 2000 in the Far East, Near East, Africa and Latin America. Total protein would need to increase by a slightly greater percentage, and animal protein would be needed in amounts four to seven times 1958 supplies.

For the developed regions, food supplies would need to grow only 20 to 30 percent by 1975 and 60 to 80 percent by 2000.

In Summary . . .

1. Recent food supply trends for diet-deficient regions suggest that the upward trend of the late 40's to to the mid-50's may have leveled off near the 1958-59 level.
2. Diet-deficient areas depend heavily on cereals, starchy roots and sugar for their calories, increasing the chance of vitamin, mineral or protein deficiencies.
3. Malnutrition is a serious problem in some parts of the world. None of the four diet-deficient areas had average calorie supplies much above the minimum physiological requirement.
4. Population growth, per capita income gain and advancing technology will all play important roles in the future food demand.
5. Future food needs under the most demanding assumption of rapid population growth and improved nutrition levels present a startling picture. We can be sure that the world food situation will be a subject for close scrutiny from many points of view in the coming years.

Next month we will examine a long-run solution to the surplus problem: increased international development and trade.